The role for Met Office in Net Zero

Description

What does Net Zero mean for the Met Office and where can our world-leading science and capability help?

The UK has pledged to become Net Zero by 2050. That means that the UK's emissions of greenhouse gases into the atmosphere need to be net neutral by that date. Any emissions that do remain after that point will need to be balanced by measures to draw down an equivalent amount of carbon from the atmosphere. This is the UK's contribution to the ambitious global aim of limiting warming, measured since pre-industrial times, to below 1.5C when compared with pre-industrial levels. The Recent IPCC Working Group 3 assessment report highlighted that the best chance of limiting warming to below this level will require urgent, large-scale and sustained action to reduce global emissions.

Professor Jason Lowe OBE said: "This is an enormous undertaking for the UK that has to be achieved in under 30 years. In fact, the changes necessary to meet Net Zero may be some of the largest that society will have witnessed since the start of the industrial revolution – the period of history which initiated an almost two-century rise in greenhouse gas emissions.

"These are challenging times, but within the challenges lie exciting opportunities for the development of clean energy and other low-carbon technologies. And these technologies and changes to how we live

and work will bring other co-benefits, such as improved air quality, better health and biodiversity gains.

“By 2050 the Met Office will be approaching its 200th anniversary, so it is fitting that as we look ahead to this milestone we should consider how our science and forecasting capability can best be used to get the nation on the path to Net Zero.”

There are at least four areas where the Met Office’s science and capability can make a contribution to the national efforts to reach Net Zero:

- Refining the estimates of carbon budgets and emissions pathways that deliver net zero using our most comprehensive earth system models, which were developed with our academic partners across the UK. This will also help us to better understand the capacity of the natural system to take up carbon in a changing climate.
- Working with the energy sector to better understand supply and demand. For example, using climate projections of future decades to provide information on the most appropriate siting of renewable energy sources to deliver the maximum benefit. In the shorter term the Met Office’s weather and seasonal forecasting capability has an important role to play in helping energy companies match the renewable supply to the rises and falls in energy demands from industries and consumers.
- Providing more information to the public to help them to make informed greener choices about their day to day lives. For example, by advising with more accuracy which days will have better weather to walk or cycle to work or to dry laundry on a washing line, rather than relying on tumble drying.
- Delivering the local scale projections of future extreme weather conditions that are needed to ensure the low carbon infrastructure we build is made resilient to the part of climate change that we can’t avoid through emission reductions.

The Met Office is also mindful of its own emissions of greenhouse gas emissions and has a policy in

place to reach net zero by 2030, including through the use of clean energy and reductions in emissions from travel.

Jason Lowe added: “Climate and science is increasingly going beyond just defining the challenges of climate change and is instead focusing on how we can respond. Our climate services are aimed at helping the Government, organisation and individuals make informed decisions so that each can play a role in taking us towards a resilient net zero future.”

The Met Office also has an important task helping to monitor the progress toward net zero by looking at a range of climate observations and of greenhouse gases. Check out the current state of the climate through our climate dashboard https://climate.metoffice.cloud/

Date Created
May 2022

April showers dwindled in dry month

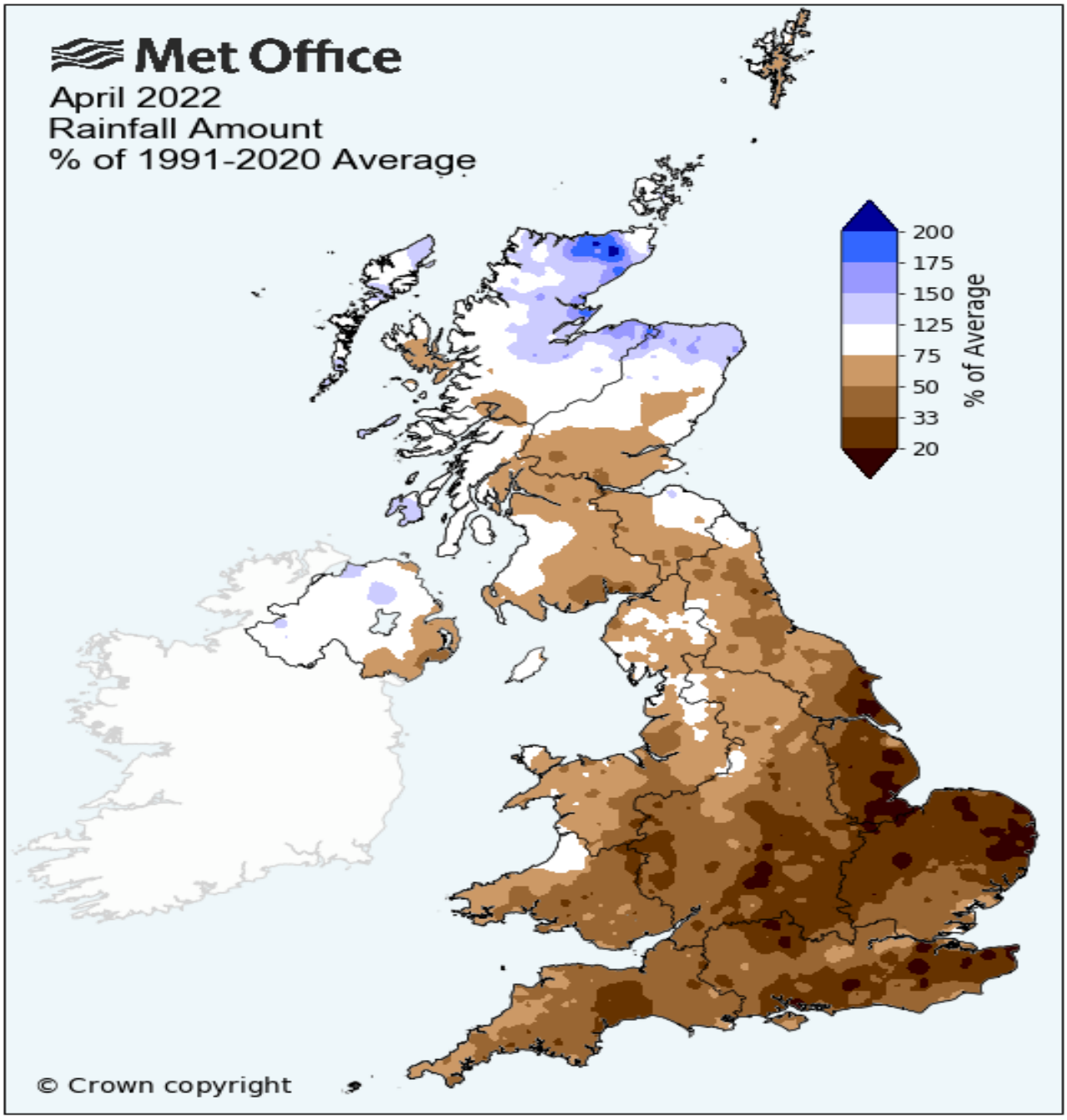
Description

April showers were in short supply for the UK in 2022, according to provisional figures from the Met Office.

The UK had around a third less rainfall than its average for the month, with southern areas especially dry as high pressure dominated for much of the time. The UK continued the recent trend of dry Aprils in recent years, with an average of 48.9mm falling; this is just 68% of the long-term average. This remains wetter than just 20.6mm of rainfall in April 2021, and even the 30mm of rainfall in April 2020.

Despite a predominantly dry theme, some areas in the north and far west have got closer to long term average figures for rainfall, and even exceeded them in some isolated locations. Scotland had 92% (85.7mm) of its average rainfall, while Northern Ireland got 96% (71.4mm).

England and Wales were the driest nations of the UK, with 44% (24.7mm) and 53% (46.6mm) of their average rainfall respectively. Southern England was particularly dry, with just 36% of its average rainfall with just 19.1mm falling in the month.



April 2022 rainfall amount

Dr Mark McCarthy of the National Climate Information Centre said: “High pressure has been the prime influence of UK weather in April 2022, bringing with it a good period of calm and settled weather, especially in the south.

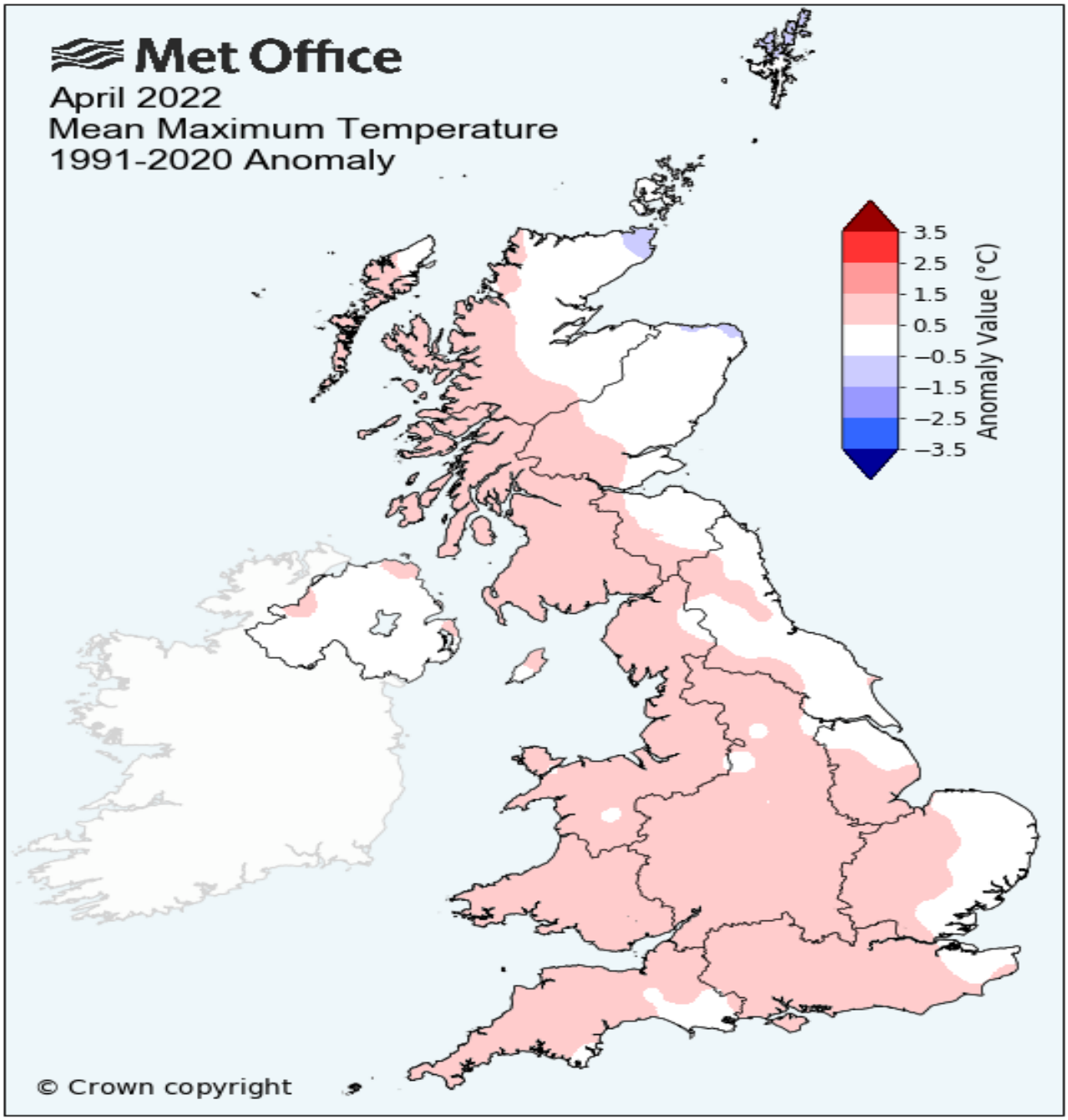
“Although there was some rainfall in northern areas early in the month, the Azores High helped to repel away any persistent incursions of unsettled weather at the start of the month. Later on, another high-pressure system remained dominant, but this time centred more towards Scandinavia or Iceland. What this chiefly did was create a good amount of clear skies while keeping rain away. This also resulted in the mix of above average maximum temperatures, with below average minimum temperatures

overnight.”

Mild, mostly

Average maximum temperatures were widely above average for April, albeit with some slightly lower overnight temperatures.

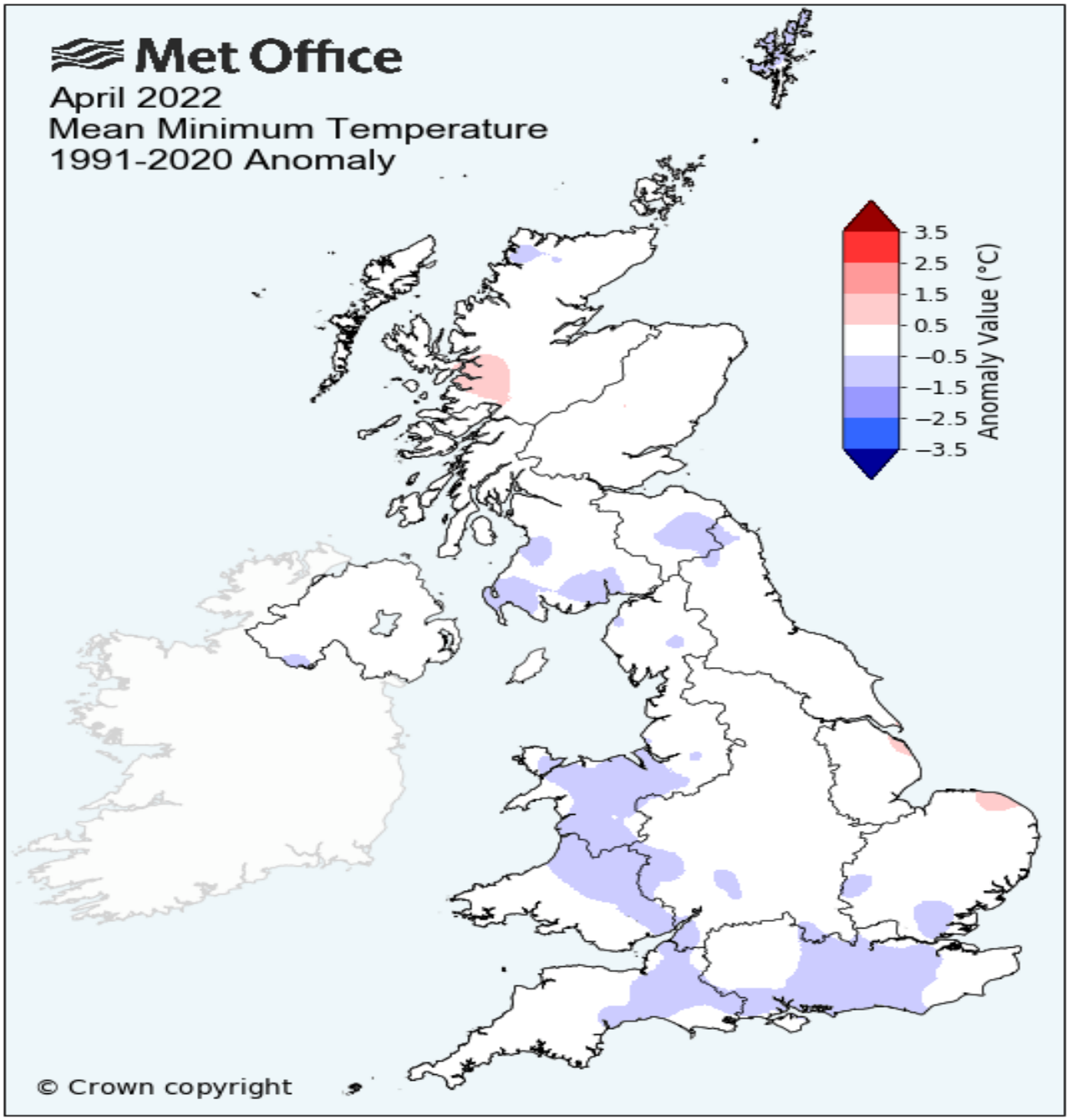
An average maximum temperature of 12.6C for the UK stood at 0.6C more than the long-term average figure. England’s figure was 13.7C (0.6C above average), Wales 12C (0.8C above average), Scotland 10.8C (0.4C above average) and Northern Ireland 12.3C (0.3C above average).



April 2022 average maximum temperature

The highest individual temperature reached in April 2022 was 23.4C on the 15th, at St James's Park, London.

With high-pressure and clear skies the largely dominant theme for the month, minimum temperatures were subdued and slightly below average for the UK. 3.5C was the average minimum temperature, which is 0.2C lower than average.



April 2022 average minimum temperature

This cool overnight theme contributed to above average levels of air frost in the UK, with an average of

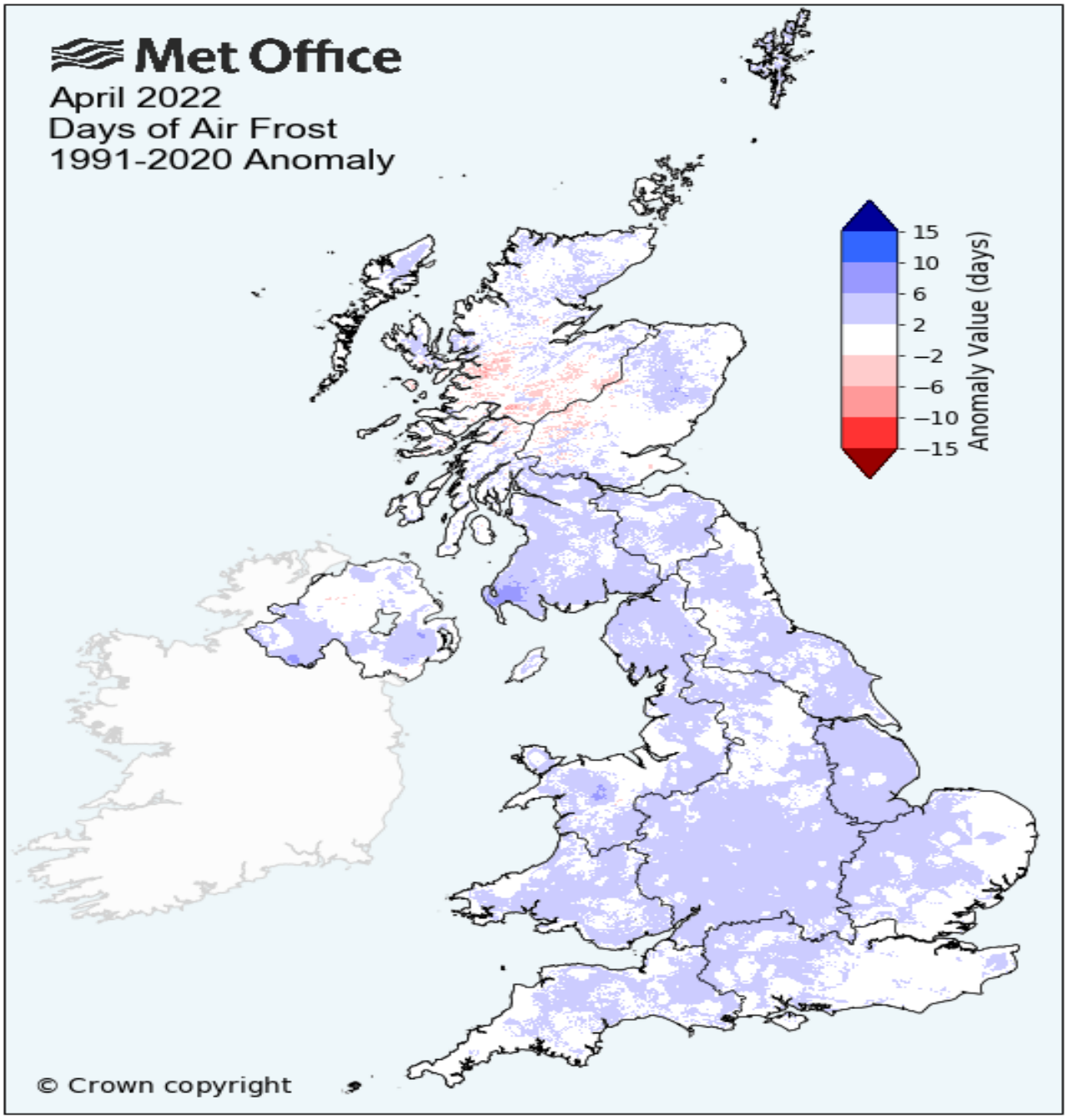
5.9 days of air frost, which is more than the average for April of 4 days.

Interestingly, April 2022 had more days of air frost than February this year, which had an average of just 5.4 days. In a series from 1961, this is the sixth time that April has been frostier than either January or February, this is usually due to a mild winter month with an absence of frost. However, April 2021 holds the current record for the average amount of air frosts, with 14 days.

The Royal Horticultural Society's Chief Horticultural Adviser Guy Barter said: "Cold nights hold back plant growth so much flowering is delayed although tough flowers such as narcissi and bluebells last and can be enjoyed longer.

"Soil has been slow to warm up and sowing tender seeds such as runner beans, courgettes and sweetcorn is on hold for at least a fortnight.

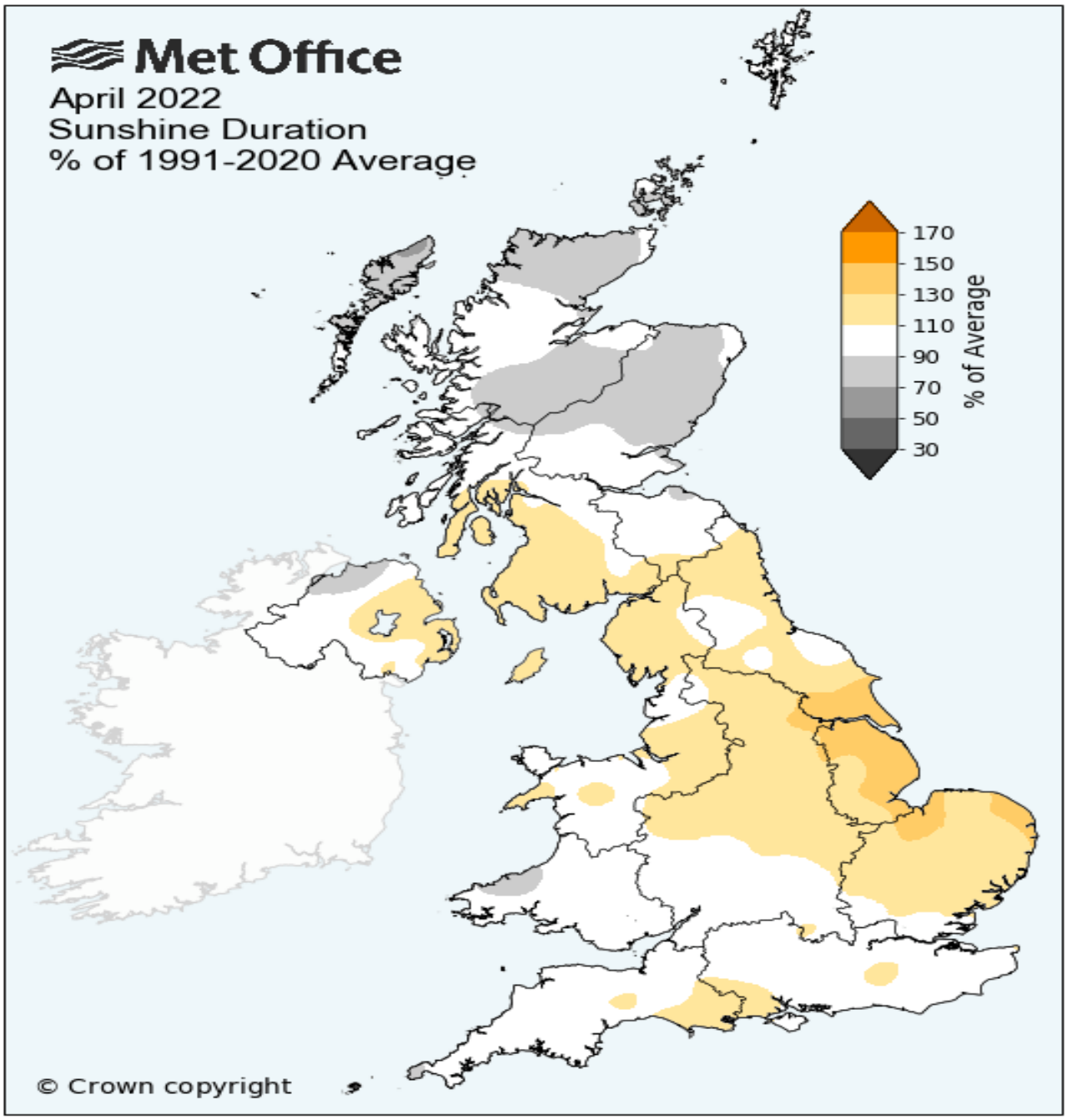
"Fruit flowers are vulnerable to frost and it is likely that the apple and pear crop will have been affected. However in many regions garden fruit trees had little crop last year due to spring frosts and were consequently laden with blossom this year. With luck enough flowers and fruitlets will have survived to give a fair crop in 2022."



April 2022 days of air frost

Some sunshine

The persistent high pressure meant a predominantly sunny picture for April, except for Scotland, which had only slightly fewer sunshine hours than average. The UK had an average of 166.1 hours of sunshine, which is 7% more than average. England led the way for sunshine hours for the nations, with an average of 185.1 hours of sunshine (13% above average), followed by Wales with 161.4 hours (2% above average), Northern Ireland with 157.1 hours (6% above average) and then Scotland with 136.9 hours (3% below average).



April 2022 sunshine duration

Provisional April 2022	Mean temp (°C)	Sunshine (hours)	Rainfall (mm)

	Actual	Diff from avg (°C)	Actual	% of avg	Actual	% of avg
UK	8.1	0.2	166.1	107	48.9	68
England	8.9	0.2	185.1	113	24.7	44
Wales	8.3	0.2	161.4	102	46.6	53
Scotland	6.7	0.2	136.9	97	85.7	92
N Ireland	8	0.1	157.1	106	71.4	96

Date Created
May 2022

Warmer weather on the way, but will it be a heatwave?

Description

The transition from spring to summer looks set to continue next week, with higher temperatures in the forecast thanks to a spell of high pressure, but would it be classed as an official Met Office heatwave?

After an unsettled end to this week with some rain for western areas, high-pressure looks to be building back in from the south on Saturday, setting up what should be a relatively warm spell with temperatures likely reaching the low 20s for some areas, most likely in the south.

Alex Deakin presents the 10 Day Trend

Speaking in the Met Office's Ten Day Trend, Presenter Alex Deakin said, "What happens to the jet stream over the weekend is a bit of a push out in the Atlantic, so the jet steam arches up to the north and this ridging high up in the atmosphere allows high pressure to build across the UK. This high pressure will bring most of us a fine and dry weekend… but not spectacularly warm."

After the weekend, while there's still some uncertainty as to the exact positioning of the high pressure, mild weather will continue to be the main theme for most.

Alex continued: "High pressure continues to dominate through the weekend, probably into the early part of next week and maybe even beyond. However, it is dependent on what happens on the other side of the Atlantic with weather fronts trying to push in during Monday and the exact position of the jet steam will dictate how low-pressure systems try and push in from the northwest."

That set-up looks likely to continue for much of next week, with low pressure systems trying to move in from the northwest and the high pressure closer to the southeast. How these systems interact will determine the exact forecast for next week, although higher temperatures look to be continuing for most.

"We're likely to be drawing our air in mostly from the south or southwest. That would bring the chance of some moisture from the Atlantic but it would also bring some warmth. However, a subtle shift in the pressure pattern could allow us to tap into some warmer air," said Alex.

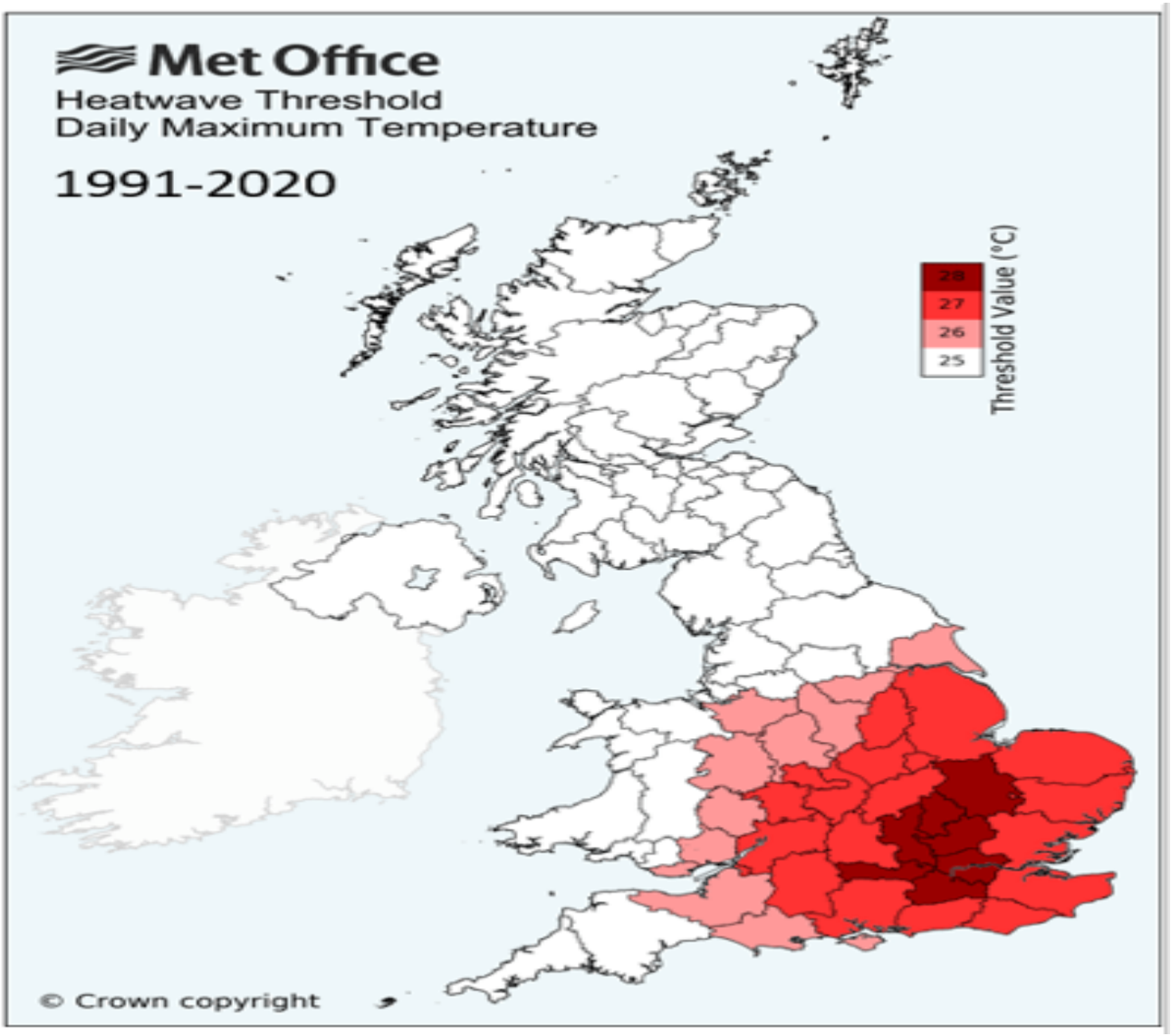
"If the high is just a little bit further east, it will allow low-pressure systems closer to the UK – so an increasing threat of showery rain in the northwest. But it would potentially allow more of a southerly flow and allowing us to tap into some warmer air coming up from the near continent. The exact amount of warmth we will see be down to the subtle positioning between the high and low pressure systems."

Despite the outlook showing positive signs of some warmer weather next week, it's still unclear how much cloud cover could have an impact on the weather. More details will be available on this element of the forecast closer to the time. Keep up-to-date with the latest forecast on the Met Office app, website or on social media.

Will it be a heatwave?

Despite some media reporting of an imminent prolonged heatwave, most locations look shy to reach the required thresholds for three consecutive days in order for it to be considered an official heatwave by the Met Office's standards.

A heatwave is defined by reaching a specific temperature threshold on three consecutive days. The threshold for a heatwave temperature differs by county, with some areas in the southeast having a threshold of 28C, while areas to the north and west have a threshold of 25C.



The heatwave threshold map of the UK. An official heatwave is when a county exceeds the threshold for three consecutive days.

Date Created
May 2022

‘Weather forecasts make a real difference when lives could be in danger’

Description

The Met Office weather forecast helps people make better decisions to stay safe and make the most of their day. In fact, 83% of the public trust the Met Office to do just that*.

But Met Office forecasts are also used by **critical services around the UK** to help keep the public safe every day.

When it comes to accurate forecasts, the Met Office stands above the crowd. Our global Numerical Weather Prediction model, which is the foundation of our accurate weather provision, is relied on by experts across the globe to contribute to safety of life operations, including air transport.

We are trusted when it really matters by many organisations including Government, charities, emergency responders and businesses.

Our accurate local forecasts are used by key regional and national services from blue light emergency services to mountain rescues, RNLI to National Air Traffic Services.

Expert forecasts are relied on by those who need them most, when accuracy matters.

Helping the experts plan

For example, Mountain Rescue England & Wales Senior Executive Officer Mike Park explains, “Accurate mountain weather forecasts can make a real difference in ‘safety-to-life’ situations.”

Met Office forecasts are used by Mike’s team to enable mountain rescue crews to prepare the best way they can for trips to keep themselves and those they help safe. By working with the Met Office, Mountain Rescue England & Wales can be as prepared as possible for any treacherous conditions caused by the weather.

“Our teams can plan ahead to have the right equipment and make important decisions about appropriate actions to take,” said Mike.

Mountain Rescue England & Wales Senior Executive Officer Mike Park

By land or by sea

Similarly, RNLI lifeguards help to protect the public around the coasts of the UK, using the Met Office forecast to keep them on top of the conditions near the beach.

RNLI lifeguard Iona Hamilton said: “We use the Met Office forecast on a daily basis to inform us on what we can expect in terms of temperature, wind speed and direction, tide times, offshore wave conditions and UV levels.

“It means as lifeguards we have the weather-related knowledge and information to keep the public safe.”

RNLI lifeguard Iona Hamilton

Or in the skies

Mountain, sea and land operations of critical services are supported by the Met Office, and it’s no different when you look to the skies.

National Air Traffic Services help keep planes safe in the skies and when landing. With an embedded Met Office forecaster working alongside them in Swanwick Control Centre, their access to Met Office forecasts helps with flight planning and operations.

Darren Bunce, Planning Manager for Airspace Capacity Management at National Air Traffic Services, said: “Having an embedded Met Office forecaster… we not only have accurate forecast information at our fingertips, but we also have the benefit of their expert advice which is really important when extreme weather conditions coincide with peak travel times.”

Planning for emergencies

For Ian Townsend, Civil Contingencies Research Officer at Nottinghamshire Police, accurate Met Office forecasts are of paramount importance.

“We access not only publicly available information, but additional safety-to-life resources the Met Office provides. We also have direct contact with their professional forecasters… which further supports us to act with confidence when making operational decisions.”

Day-to-day operations are also enhanced by accurate, up-to-date forecasts. West Yorkshire Police Chief Superintendent Ed Chesters said: “From missing people searching, to traffic, to natural emergencies such as floods, it’s vital that we know the prevailing weather conditions at any given time.”

West Yorkshire Police Chief Superintendent Ed Chesters

To save lives

When it really matters, critical services trust the Met Office to provide accurate weather forecasts that help their operational planning and decision making to protect the public and save lives.

So, you can be sure those forecasts will help you **plan your everyday too**. Find out more about When Accuracy Matters on the Met Office website.

Download the free Met Office app for accurate local forecasts from the App Store (Apple) and Google Play (Android)**.**

*83% of adults in a YouGov survey from March 2022 said they trusted the Met Office.

Date Created
May 2022

Exploring Anglian Water’s water resource extremes using novel techniques

Description

Climate change projections show UK rainfall patterns are expected to shift, placing extra challenges on regional water companies seeking security of supply for their customers.

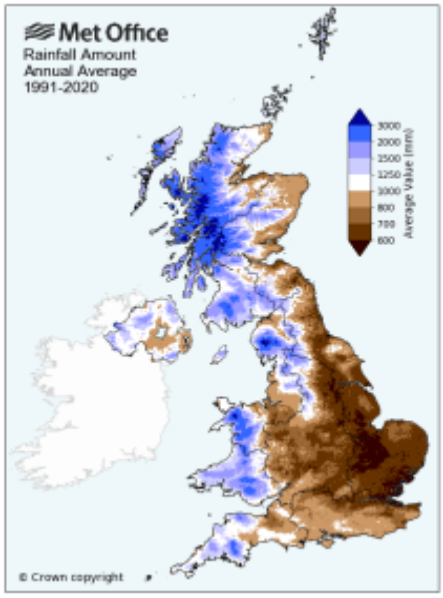
One of the regions that could potentially be most affected is East Anglia, where much of the region’s water supply is provided by Anglian Water.

With just under 630mm of rainfall annually, East Anglia is the driest region in the UK. Remarkably East Anglia is renowned for its diversity of wetland features and landscapes, including the Fens, the Broads and chalk streams, such as this example in Lincolnshire. Picture: Anglian Water

Geoff Darch is Water Resources Strategy Manager for Anglian Water. He said: “Our region is in a unique situation as the majority of water supplies come from significant aquifers and reservoirs that are slow to recharge. As such, the region is particularly vulnerable to droughts arising from multi-month to multi-year rainfall accumulation deficits.

“A few months of below average rainfall is manageable, but below average rainfall spanning one to two years can lead to significant drawdown of stored water.

“To ensure water resource risk is appropriately quantified, there is a requirement for these drought characteristics to be represented in the data used for our planning. This is where Anglian Water and the Met Office have been working together to explore novel approaches and datasets.”



UK annual average rainfall 1991-2020

The Industry Consultancy team at the Met Office has been supporting Anglian Water in key components of its Water Resource Management Plan (WRMP), further strengthening understanding of drought risk. Quantifying drought extremes – both today and in a future, warmer world – allows Anglian Water to enhance resilience. It also supports key aspects of Anglian Water’s Drought Plan.

Dr Joe Osborne is a senior climate consultant at the Met Office. He said: “As part of this work, the Industry Consultancy team has developed a statistical model to enhance Anglian Water’s understanding of extreme events. The model is used to generate 1,000 alternative realisations of a 105-year historical period (1914-2018), with outputs on a 5-km grid over the region. The output validates rainfall and drought behaviour well.

“These simulations can be thought of as alternative historical outcomes allowing Anglian Water to test different and more extreme drought events. The work has also been extended to incorporate the effect of climate change, using climate model data from the UKCP18 climate projection dataset to allow for simulation of future rainfall at a number of key global mean warming levels.”

The Met Office has explored other emerging science on behalf of Anglian Water. For example, by exploring multi-year drought over the Anglian Water region.

Geoff added: “This activity helps us to deliver our stated purpose: to bring environmental and social prosperity to the region through our commitment to ‘Love Every Drop’. Understanding the investment

decisions that are required to protect our customers against future weather and climate extremes is paramount.

“We need to make decisions based on robust and defendable science, and this requires us to ensure the robustness of our current assets and future systems to a wide range of potential droughts and climate scenarios. Undertaking this challenging work with the Met Office means that data-driven investments are made where appropriate, ensuring that we better protect our customers and the environment we serve in the face of an ever-changing climate.”

Date Created
May 2022

Parts of Pakistan and north-west India to endure +50C temperatures

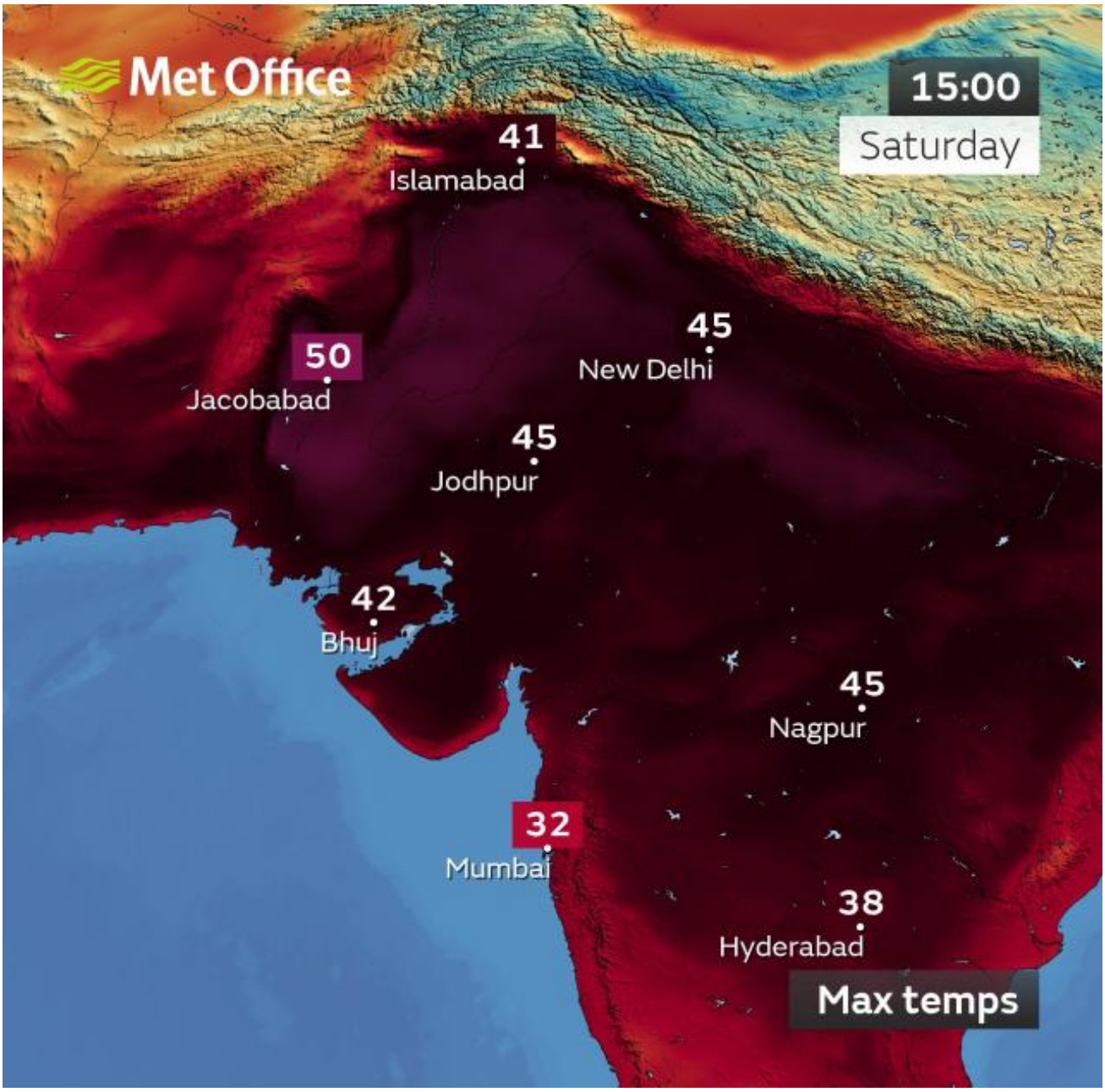
Description

A brutal heatwave that has enveloped parts of southern Asia since the end of April looks set to intensify, says the latest forecast from the Met Office.

Nick Silkstone is a meteorologist with the Met Office's Global Guidance Unit. He said: "Temperatures are expected to peak on Saturday, when maximum values could reach around 49-50°C in the hottest locations, such as Jacobabad, and the Sibi area of Pakistan.

"These values are around 5-7°C above average for the time of year. The heatwave will ease into Sunday and the early part of next week when temperatures return nearer to average with maxima in the low 40s°C.

"However, temperatures are expected to trend upwards again during the second half of next week, and reach similar – or even slightly higher – values to the current spell by the following weekend."



Parts of north-west India and Pakistan could witness temperatures of more than 50C in coming days.

Official observations show the current run of very hot days began on the 7 May, with absolute maxima of 48°C being recorded at both Jacobabad and Sibi in Pakistan. Yesterday (11 May) the highest temperature was again at Jacobabad with a maximum of 47.4°C.

Nick Silkstone added: “The extreme heat poses risks for local communities and adds to the threat of wider environmental impacts, such as wildfires and the threat of glacial lakes creating flash flooding events as the ice in front of these lakes gives way due to the extreme heat.” It is understood that the authorities in Pakistan and elsewhere in the region are on high alert in the case of a glacial lake outburst flooding incident triggering downstream impacts.

Peter Stott is the Met Office's head of climate attribution. He said: "The science of climate attribution looks for evidence within extreme weather events and whether they can be 'attributed' to climate change.

"Although it is too early to say definitively that the southern Asian heatwave has a direct link with climate change, we know there has already been considerable background warming driven by a changing climate often making current extreme heatwaves even more extreme."

Secretary-General Prof Petteri Taalas at COP26 in Glasgow. Picture: Grahame Madge, Met Office.

"Heatwaves have multiple and cascading impacts not just on human health, but also on ecosystems, agriculture, water and energy supplies and key sectors of the economy. The risks to society underline why the World Meteorological Organization is committed to ensuring that multi-hazard early warning services reach the most vulnerable," said WMO Secretary-General Prof. Petteri Taalas.

Why do India and Pakistan get so oppressively hot at this time of year?

As the Northern Hemisphere Spring progresses, the point on the earth directly beneath the sun during the middle of the day (known as the sub-solar point) progresses northwards. This is currently across central India, meaning that the largely dry landmass (as the dry northeast monsoon continues) is baked by the directly overhead sun.

In addition, atmospheric subsidence above this region causes the air to heat (by squashing the air in a process known as adiabatic compression). This effectively acts as a lid and allows temperatures at ground level to increase further.

Nick Silkstone added: "Episodes of strong subsidence across this region, are strongly correlated to the

most severe heatwaves. This pattern is only transient, as eventually the large-scale wind patterns reverse causing the onset of the wet phase of the monsoon which brings some relief from the oppressive temperatures in this region. Although for NW India and Pakistan the wet phase of the monsoon doesn't usually reach them until late June to mid-July."

You can hear more about the southern Asian heatwave on our latest Weather Snap podcast.

Date Created
May 2022

Behind the scenes of Storm Eunice and landing aircraft safely

Description

Storm Eunice impacted southern England and Wales on 18 February 2022, with widespread disruption and damage for much of the UK in what was the most severe and damaging storm to affect southern areas since February 2014.

However, although the storm brought significant disruption for many, some of the most striking images from the day were of aircraft landing at Heathrow Airport, wrestling with the wind to get down safely in tricky conditions.

It was down to the air traffic control service, NATS, working behind the scenes to keep things running smoothly in this challenging environment.

With wind gusts widely around 80mph and even a 122mph gust recorded at an exposed site on the Isle of Wight (a new England gust record), it was a busy day towards the end of a demanding week for NATS, but one that was helped by an early and accurate warning from the Met Office.

Accurate, early forecasts

Deputy General Manager Brian Wheeler was part of the team leading the response from NATS. He said: “We knew from fairly early on that disruptive weather was on the way. We have a Met Office forecaster embedded within our team and we could see the signals from a while away that stormy weather would be the theme for the week, with a likely sting in the tail towards the end.

“The early warning from the Met Office enabled us to manage our team and ensure we had suitable cover on days that would be the most disruptive in terms of the weather. This was crucial in managing our response and keeping people safe.”

The Met Office named three storms in a week for the first time since storm naming was introduced in 2015, as Storm Dudley, Eunice and then Franklin impacted the UK. Storm Eunice triggered two Red Weather Warnings from the Met Office as there was a significant danger to life.

Help managing the skies

NATS manages airspace to ensure that pilots have the space to land safely, and on days where there’s disruptive weather, that management can be quite a complex task. As witnessed on Big Jet TV, when aircraft make a landing attempt but aren’t able to successfully put the plane down, they will choose to ‘go-around’, where they climb to a safe altitude and, in most cases, attempt another approach and landing. It’s NATS’ job to make sure that’s facilitated safely.

On an average day, Heathrow might expect one ‘go-around’ a day. For Storm Eunice, they had 40from just 7am to 2pm.

Video showing flight paths at Heathrow for Storm Eunice. Video courtesy of NATS

Brian continued: “When a pilot initiates a go-around, as happened fairly frequently with Storm Eunice, our job is to manage the airspace and ensure that aircraft can have space in the queue to make another landing attempt, or perhaps redirect them elsewhere if a safe landing isn’t possible.

“Because of the accurate early forecasting from the Met Office, we were able to manage our team’s time to ensure we could take on the increased workload for Storm Eunice, but it also meant that on the day we could be confident about how the weather was going to play out, in terms of wind speeds and when they would ease off.”

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Date Created
May 2022

Summer’s on the way – here’s how you can make the most of it

Description

WeatherReady is run by the Met Office in partnership with the Cabinet Office.

As the summer weather once again dominates conversations around the UK, there are simple steps everyone can take to be prepared – no matter what the weather throws at you.

To help you take control of how it affects you, we have joined together with expert partners to provide advice and tips on staying safe in summer weather, as well as how to make the most of it.

#WeatherReady is run in partnership with the Cabinet Office and provides tips and guidance on simple actions people can take to reduce the negative impacts weather could have on their lives.

This summer, the Met Office and partners are focusing on three key summer weather types and how to be prepared for them:

- Summer heat
- Summer storms
- Summer rainfall

Summer heat

Check the UV levels before heading out.

Hot weather during the summer can be fun but it's worth taking a few simple steps to make sure you can enjoy it fully.

While the long-term average maximum temperature for summer in the UK stands at 18.9C, more extreme levels of heat are always possible for a time, as shown in 2021 when Northern Ireland broke its all-time temperature record hitting 31.3C at Castlederg on 21 July.

Hot weather has potential impacts for all, but especially so for older people, babies and those with underlying health conditions. In order to be prepared ahead of hot weather, it's a good idea to check on tips for keeping cool in hot weather to make sure you're ready for any high temperatures or prolonged hot spells.

Other potential impacts of hot weather can be high UV levels and high pollen levels. The Met Office App has a specialist UV forecast and you can sign up for pollen notifications to help you to be prepared. Download the app ahead of hot weather to keep up-to-date so you can make sure you have enough sunscreen and hay fever medication.

Pets also aren't immune to hot weather, as well as hay fever. Be aware of what you can do to make sure they don't overheat, including avoiding the hottest times of the day and choosing suitable places for their daily walks.

When the sun is shining, we think about getting out and about and maybe being a bit more active. It's important to check the forecasts in advance when you're planning an outing or activity to make sureyou have the right kit with you. To avoid heatstroke and sunburn the NHS recommends you wear sunscreen and a hat and drink plenty of water. So, if you're spending time in your garden, try to avoid the hottest part of the day, and follow NHS guidance.

If you're heading out and about, heat-related faults in your car or campervan can leave you stranded by the side of the road. A few simple checks, courtesy of the RAC, can help you avoid the stress.

Summer storms

Take the worry out of summer storms.

Despite what some people may think, storms certainly aren't confined to winter in the UK. In July 2021 Storm Evert impacted the UK with gusts widely over 45mph, bringing some disruption to roads and holidaymakers.

In addition, thunderstorms are more likely in summer. Thunderstorms occur when the earth's surface is heated and warm air near the ground rises into cooler air, creating water droplets which then often fall as thundery downpours of rain. In a UK summer, this meteorological phenomenon can occur fairly frequently, with a mix of warm air from the south and cool air from the north often vying for dominance over the UK. Take some time to learn how to stay safe in thunder and lightning before it's in the forecast so you know what you should be doing.

You can take the worry out of summer storms by doing simple things around the home in preparation. Take some time to think about objects that could be moved by strong or sudden gusts of wind, especially if they could break windows or blow into the road. Also, try to park your car away from

objects that could be moved be strong winds or unstable trees.

Power cuts are also possible during summer storms. It's a good idea to know in advance what you need to have to hand in the event of a power cut. This includes advice around keeping important information in a safe place and having a 'grab bag' ready with supplies should the power go out.

Summer storms with strong winds can create dramatic scenes particularly at the coast but it can be dangerous and advice from HM Coastguard and the RNLI is to stay well back from stormy seas and cliff edges. If you see anyone in trouble, call 999 and ask for the coastguard.

For more advice, here are the RNLI's 10 tips for visiting the beach this summer.

Summer rainfall

Consider the impact of heavy rainfall.

Summer rain can happen suddenly and be quite intense. In addition, as the atmosphere warms as a result of human-induced climate change, the air can hold more moisture which can lead to more intense rainfall events both now and in the future.

On average, summer in the UK is actually wetter than the spring, with an average of 253.4mm of rain falling in June, July and August. That level of rainfall isn't consistent across the UK however, with Scotland, on average, seeing the most rain with 315.6mm. Wales has an average of 302.4mm, Northern Ireland 270.2mm and England 206mm.

If you're heading out and about, think about kit that might be useful and download the Met Office app so you can get up-to-date, accurate local forecasts and be prepared to change your plans if the rain looks particularly impactful.

Did you know that a heavy downpour can affect bathing water quality? If you are heading to one of the UK's many beaches, rivers, lochs or lakes, it's worth knowing how you can tell if you can swim safely or should choose another spot.

Driving during intense summer rain can be hazardous, so it's important to consider your plans if it looks like severe weather is in the forecast. If you do have to drive in severe weather, National Highways, RAC and the Institute of Advanced Motorists have brought together some practical advice.

It's not just when you're on the move that heavy rain can impact on people during the summer. Ahead of severe weather, it's a good idea to clear gutters and drains around your home to help reduce any potential impacts on your property. The best way of avoiding summer flooding is to be prepared, so check with the UK flood agencies if your area is susceptible to flooding.

Get all your summer weather advice with the Met Office and expert partners on WeatherReady on the Met Office website.

Date Created
May 2022

Are mid-20°C temperatures in May unusual?

Description

The UK's hottest day of 2022 so far was recorded at Heathrow with 27.5°C today (17 May 2022), leading to interest in how often we record these kinds of temperatures in the UK during May. Mike Kendon, from the Met Office National Climate Information Centre, puts this latest temperature recording into context.

As we get closer to summer, we often see more excitement about higher temperatures and the chance of heatwaves. Although we're a way off an official heatwave, there has been interest in the UK reaching mid-20°C in May.

> It's now the warmest day of the year so far as temperatures have climbed to 27.5°C at Heathrow ?? pic.twitter.com/kbWakBdCJi
>
> — Met Office (@metoffice) May 17, 2022

Today's highest temperatures were confined to the southeast of England, with only 15 stations recording 25°C or above. The temperature of 27.5°C at Heathrow is around 10°C higher than the May 1991-2020 long-term average daily maximum temperature but nevertheless falls far short of the UK's all-time May record of 32.8°C.

The Met Office observational record shows that 25°C is not a particularly unusual temperature for this time of year.

Looking at individual station data for the first recording of 25°C or above, interestingly, despite large annual variability, there is a clear shift in the date when 25°C or higher is first occurring in the UK moving earlier in the calendar. Based on the period 1961-1990, the average date is 19 May compared to 6 May for the period 1991-2020. Meaning that the first day of the year when 25°C or higher is recorded in the UK has moved forward by almost a fortnight between the two 30-year periods.

The earliest known occurrence of temperatures in excess of 25°C in the calendar year is 29 March with recordings in 1965 and 1968.

Inevitably with climate change in everyone's mind, there is often the question of if higher temperatures are because of human influence. The statistics above reflect maximum temperatures at specific locations. By averaging the temperature across the whole of the UK we can also get a measure of widespread warm days, for example by measuring how often the UK average is above 20°C at this time of year.[1]

In the 1961-1990 averaging period there were 35 May days with a UK area-average daily maximum temperature of 20°C or above. In the 1991-2020 averaging period there were 76 May days with a UK area-average daily max temperature of 20°C or above. This means that the number of warm days in

May has more than doubled in 30 years by this measure.

When examining the link to climate change it is important to not only look at extremes though. The UK average mean temperature for May has increased from 9.8°C to 10.6°C in 30 years (1961-1990 compared to 1991-2020). As our climate warms, we expect to see a corresponding increase in the number of hot days.

[1] Data: HadUK-Grid

Date Created
May 2022

‘Blood rain’ in the news – but what’s the reality?

Description

Thundery rain has been a theme of the forecast in recent days.

Reports of ‘blood rain’ in the UK have been circulating in the news in recent days, although the reality is a little more underwhelming.

There have been some reports in recent days of a yellow haze to some recent rain and thunderstorms, especially in the southeast. Forecasters at the Met Office are able to monitor satellite imagery and the recent yellow tinge to some rain is likely due dust picked up in northern Africa, before falling with the thundery downpours.

Met Office Chief Meteorologist Paul Gundersen said: “Concentrations of dust in the recent system – which has now moved away from the UK – were relatively low so would have quickly been rained out and washed away.

“It’s not uncommon to have some dust particles mixed in with the rainfall when the source air comes from northern Africa. The most common impact of this can be a dusty film sometimes appearing on people’s cars.”

Further ahead

Source air for the weather over the UK is shifting over the next few days, so the chances of dust particles being mixed in with the rain is reduced.

Paul said: “Whereas we were previously inviting warm air in from the south, the next few days will see the air over the UK have more of a marine origin, which reduces the chances of dust being mixed in with the rain and giving that bit of a yellow haze.”

However, early next week, signals suggest the return of a southerly flow, bringing with it the chance of some dust to be mixed in with the rain. Will that mean ‘blood rain’? Probably not.

Paul said: “There’s a chance of some dust being rained-out in the southeast early next week, but any amounts of dust would be relatively small and would likely be soon washed away.”

What is ‘blood rain’?

‘Blood rain’ – as it’s colloquially called – occurs when high concentrations of red coloured dust gets mixed in with rain, giving it a red appearance as it falls.

What is blood rain?

True blood rain in the UK is very rare, despite what some headlines suggest. Yellow and brown dust in fairly low concentrations can be more common in the UK, largely resulting in a film of dust after a rain shower, but any visual impacts on the rainfall are generally minor and fairly short-lived.

Find out more about blood rain.

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May 2022

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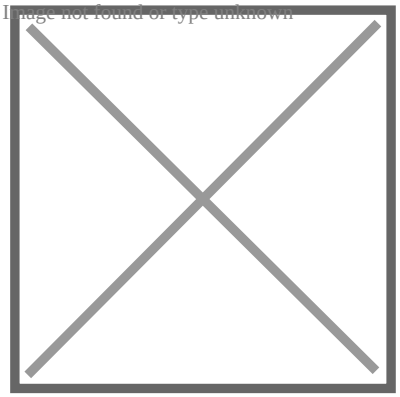

Climate risk and resilience in southern African cities

Description

Southern Africa is facing a climate emergency. The region already experiences periods of severe droughts and floods, influenced by the 'El Niño Southern Oscillation' (ENSO) cycle. Now climate change is increasing the frequency and severity of extreme weather and climate events such as heatwaves. The knock-on impact is huge. Changes to temperature and rainfall patterns in Southern Africa increase water scarcity, challenge food security, worsen health and threaten the survival of millions.

Climate change poses even more of a danger in urban areas. While heatwaves, droughts and flooding pose continued hazards to urban areas, many policymakers are unable to implement effective risk reduction strategies. Although awareness of climate change is increasing, there is a lack of relevant climate information and knowledge about what strategies they should put in place to reduce the risks. Informal urban settlements also have their own challenges, such as the provision of clean water and sanitation.

The Future Resilience for African Cities And Lands (FRACTAL) project ran from 2015 to 2021, bringing together an international team of partners, including the Met Office. It aimed to advance methods of engagement and co-produce accessible, timely, applicable climate services needed by decision-makers operating in southern African cities.

The project also strived to advance scientific knowledge about regional climate responses to human activities. Its researchers and stakeholders worked together to develop relevant and useable climate knowledge to help urban decision-makers imagine and implement resilient development pathways.

FRACTAL was coordinated by the Climate System Analysis Group at the University of Cape Town. It was part of the Future Climate for Africa (FCFA) programme – jointly funded by the UK's Foreign, Commonwealth and Development Office (FCDO) (formerly the Department for International Development (DFID)) and the Natural Environment Research Council (NERC).

The project initially involved scientists working in three target cities of Lusaka (Zambia), Maputo (Mozambique) and Windhoek (Namibia) and building relationships with people from the city organisations such as water ministries and community groups. These cities were chosen for various reasons including because they were deemed to be places involving greatest human security risk, rapid urbanisation and national decision-making.

The FRACTAL team developed a 'learning lab' approach to identify the problems the cities were

facing. The learning labs focussed on developing relationships and generating ‘safe spaces’ where partners were able to share and integrate their knowledge through engaging and productive activities.

Together, the city partners and researchers identified key climate issues for each city, with a particular focus on water-related issues: such as water supply, flooding and sanitation. The partners worked together to define and provide relevant information and decide how best to communicate issues relating to water and the impacts of climate change including potential food, water and power shortages.

Scientists working in FRACTAL developed a series of infographics and supporting materials to help decision-makers to understand future risks and consider how to adapt to them. They included climate information based on three potential storylines of the future, along with areas of impact, societal consequences and potential responses.

Despite the first funded phase of FRACTAL coming to an end, researchers are still working with the three city governments and other relevant organisations to maintain resilience building activities and consider how the work can be sustained in the long-term. In particular, the follow-on FRACTAL-Plus project has sustained relationships in Lusaka with a focus on urban flood resilience. The project has been funded by NERC and led by the University of Bristol together with the University of Cape Town, the Met Office and other organisations involved in FRACTAL. Learning from FRACTAL has also been used to inform some of the work of the FCDO-funded Asia Regional Resilience to a Changing Climate (ARRCC) programme, led by the Met Office.

Chris Jack, Deputy Director, Climate System Analysis Group at University of Cape Town, said: “Although FRACTAL was designed to explore climate risks affecting urban communities, the actual starting point was to better understand the real-world problems facing cities, covering both climate and non-climate issues, such as access to energy and water. In doing so, the project showed that uncertainty in the future climate does not prevent progress towards climate resilience. Rather, progress can be made by bringing researchers and city decision-makers together to explore solutions that address short-term and long-term issues. Climate change information was introduced later to think through alternative futures and consider how urgent development problems may be solved while also building climate resilience. FRACTAL has helped city decision-makers improve urban development policy and inspire different communities to take a more inclusive approach to climate change adaptation.”

Dr Joe Daron of the Met Office said: “Working on FRACTAL has demonstrated the value of deep and sustained engagement to achieve long-term climate resilience outcomes. Through working closely with other researchers and city decision-makers, we have built trusted relationships and learned about the complex realities facing rapidly urbanising cities in southern Africa. The project has encouraged and equipped us to go beyond traditional and siloed roles as ‘climate experts’ to be part of inter-disciplinary teams grappling with different types of knowledge to collectively address climate risks.”

Date Created
May 2022

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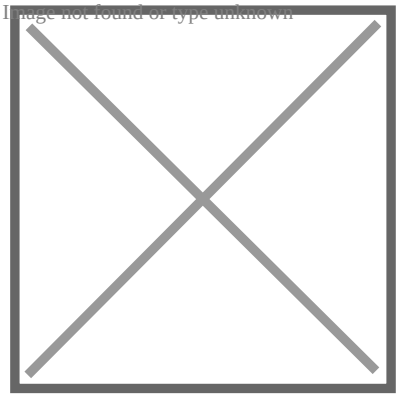


Finding resilience to city heat in Southern Asia

Description

An unusually intense pre-monsoon heatwave has been affecting northwest India, Pakistan and other parts of Southern Asia this year. Parts of Pakistan reached 51°C earlier this month, while India recorded its hottest March since 1901, and May temperatures in north India are at their highest level since 1966.

Extreme heat is likely to become more common in this part of the world. According to a World Bank projection, the annual temperature in South Asia's hotspots where approximately one in two people live is projected to increase 1.5°C – 3°C by 2050 relative to 1981-2010. Additionally, a new Met Office study , has found climate change is likely to make record-breaking heatwaves 100 times more likely.

Although this heatwave has been regarded as untypically severe, creating significant impacts for communities across the region, heatwaves are likely to become even more severe in southern Asia with climate change.

Research has focussed on understanding how heat and heat-stress (a combination of heat and high humidity) affects communities across southern Asia.

Cities are particularly vulnerable to extreme heatwaves. Urbanisation and its associated impacts, including deforestation and an increasingly concrete infrastructure, result in significant changes to local climates, known as the urban heat island effect.

Two cities – in Nepal and Bangladesh – have been chosen as research pioneers for a study by the Red Cross Red Crescent Climate Centre (RCCC), with support from Asia Regional Resilience to a Changing Climate (ARRCC) programme. The study looks at the identification of heat threshold and heat hotspots, and is intended to improve resilience and preparedness around future extreme heat events.

Nepalgunj

The city of Nepalgunj in southern Nepal is one of the primary business hubs in the country, sharing a critical border with India. Extreme heat events are a growing concern in the city, with the maximum temperature exceeding 40°C nearly every year and humidity levels occasionally reaching 80 per cent.

Another south Asian metropolitan city prone to heatwaves, Rajshahi, lies in the north-western region of Bangladesh. Humidity levels tend to peak at around 65 per cent, and the average maximum temperature is close to 43°C.

But until recently there was no systematic assessment of heat risk or coordinated action to become more resilient in either city.

The RCCC encourage city leaders to take action ahead of upcoming heat seasons to reduce the heat risk. They have produced critical study reports for Nepalgunj and Rajshahi to identify heat threshold and heat hotspots in each city. They have also developed policy briefs for Nepalgunj and Rajshahi, recommending actions in both cities to deal with acute heat events, and to build resilience against increasing heat stress. This approach is intended to help leaders to better understand when and where to act before and during heatwaves.

The strategy is the first of its kind in any Nepalese city, while Rajshahi is the second Bangladeshi city where such work has been undertaken.

Rajshahi

RCCC has also developed a related heatwave awareness campaign involving Information, Education and Communication (IEC) materials, including posters videos and social media posts in English, Bengali and Nepali.

Madhab Uprety, Technical Adviser and Asia Pacific Focal Point of RCCC, said: “By identifying heat thresholds and heat hotspots in Nepalgunj and Rajshahi, city authorities and emergency service providers can be better prepared to reduce human suffering and impacts on livelihoods.

“The hotspots help to understand the highly vulnerable areas where early action measures should be considered. For instance, Rajshahi City Corporation has identified 20 water bodies to restore and protect, and the Nepal Red Cross Society used our IEC materials for a heat-risk awareness campaign.

“If the respective city authorities continue taking our recommended short-term and long-term actions, then suffering will be minimised, and the lives of some of the most vulnerable people will be saved.”

Date Created
May 2022

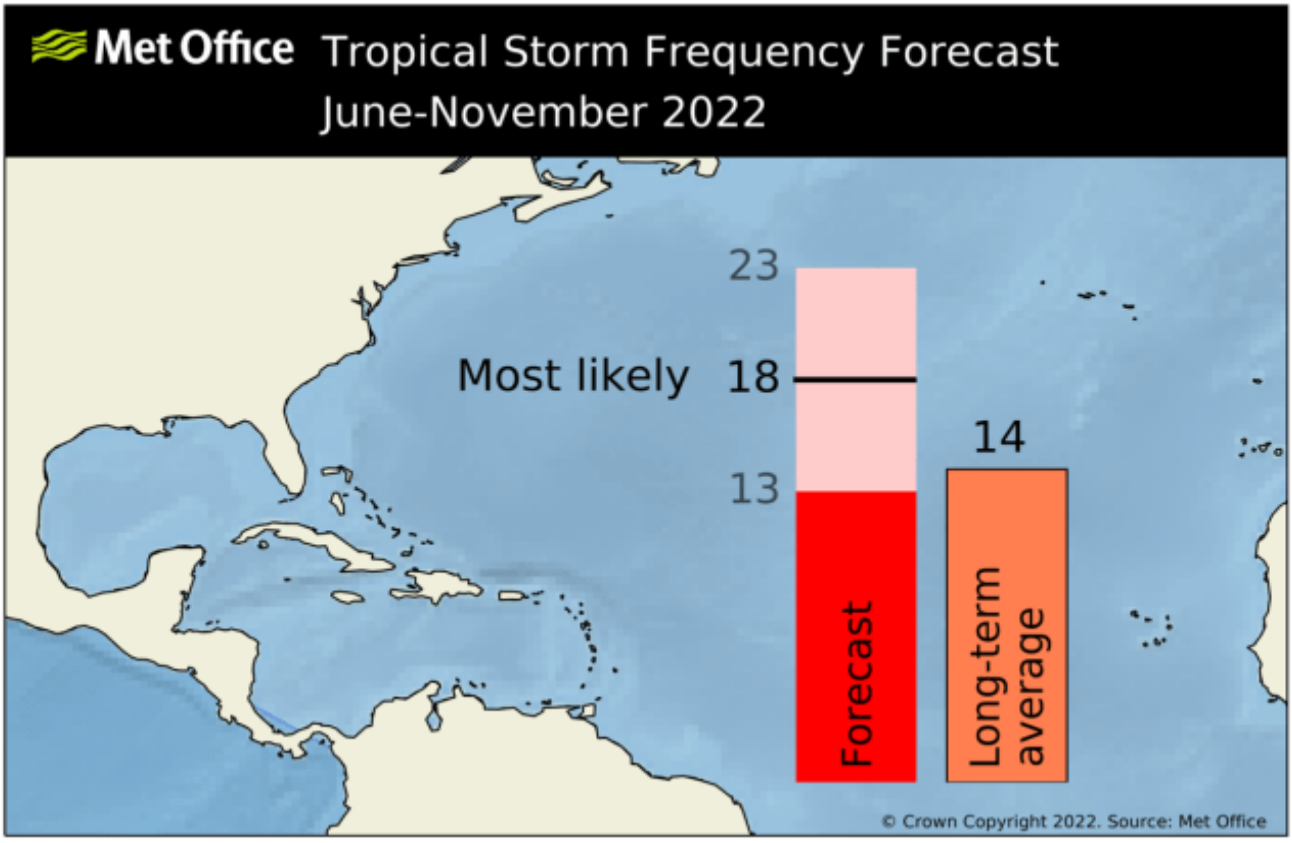
More active Atlantic hurricane season ahead?

Description

The Atlantic hurricane season – which runs from June to November – is most likely to be above average for tropical cyclone activity according to the latest seasonal prediction from the Met Office.

The forecast for the coming season indicates a likelihood of 18 named tropical storms including nine hurricanes and four major hurricanes. The long-term annual average, between 1991-2020, is 14 tropical storms, seven hurricanes and three major hurricanes. A major hurricane is defined as a system with wind speeds of at least 111mph.

Julian Heming is the Met Office's expert on tropical cyclones. Commenting on this year's forecast he said: "What is interesting this year is that the forecasts issued by many different agencies are all indicating an above-average season. As they are all pointing in the same direction this gives us a higher degree of confidence."



The forecast covers the whole of the North Atlantic Basin, including the North Atlantic Ocean, the Caribbean Sea and the Gulf of Mexico. Julian added: "Because our hurricane outlook covers a wide region, it isn't possible to determine the exact track and locations of these tropical cyclones and therefore it isn't possible to determine impacts either.

“What could happen is that the season is active, but the storms don’t necessarily make landfall. Conversely, another season may have lower cyclone activity overall, but just one or two major hurricanes making landfall can produce large impacts. However, there is a signal in our forecast for heightened activity this season to be biased towards the western side of the basin, including the Caribbean, Gulf of Mexico and the eastern seaboard of the United States.”

If the 2022 season sees above-average activity it would continue a series of active Atlantic hurricane seasons which has been ongoing since 2016. This period has seen a number of damaging hurricanes affecting the USA and the Caribbean including Hurricane Dorian in 2019, Hurricane Laura in 2020 and Hurricane Ida in 2021.

Year	Tropical storms	Hurricanes	Major hurricanes
2012	17	10	2
2013	13	2	0
2014	8	6	2
2015	10	4	2
2016	14	6	4
2017	16	10	6
2018	14	8	2
2019	17	6	3
2020	28	13	7
2021	20	7	4

North Atlantic tropical storm activity (June-November)

Climate change

Tropical cyclones derive their energy from warm water, and sea surface temperatures above 26°C are necessary to sustain them. Tropical cyclones encountering cooler waters lose intensity. With climate change raising global temperature levels it could be expected to see an increase in the frequency and intensity of tropical cyclone activity.

However, as Julian notes: “We do expect to see an underlying trend from the impacts of global warming to produce slightly stronger tropical cyclones. But on a year-to-year basis any increase is masked by the large amounts of natural variability with some seasons containing far more activity than others.”

For more information about the North Atlantic 2022 tropical cyclone forecast, listen to Julian Heming in conversation with Clare Nasir on our Weather Snap podcast.

Date Created
May 2022

British climate scientist earns international acclaim

Description

Decades of pioneering research by a Met Office-based climate scientist has been honoured with the presentation of a prestigious international climate medal.

Dr Doug Smith's research and international leadership in predicting short-term climate variations and understanding the role of sea ice in the climate system has been recognised this week by the European Geosciences Union with the award of the Hans Oeschger Medal.

Doug's work first came to prominence in 2007 when he published a seminal paper in the journal Science when he showed that including initial atmospheric conditions as well as the forcing from greenhouse gases could lead to increased accuracy and skill in climate predictions.

Professor Adam Scaife, head of the area in which Doug works, said: "Since Doug's ground-breaking study there has been an explosion of activity among the international scientific community, and multiple groups are now taking these ideas and embarking on their own initialized climate predictions."

Doug has now extended his work to show that even extreme events, such as Atlantic hurricanes, can be predicted on multiyear timescales which is now leading to applications in the insurance sector. He has also been involved in cryospheric science. In recent years Doug has co-led the Polar Amplification Modelling Intercomparison Project, bringing together multiple research groups worldwide to use an unprecedented large ensemble of individual climate simulations to pin down the atmospheric response to sea ice decline in state-of-the-art climate models.

In contrast to some of the wild claims that were being made at the time about the impact of sea ice decline on extreme winters, this very level-headed piece of work has shown that there *is* a response in the mid-latitudes: the jet stream does weaken and move further south as sea ice declines, but it is too small an effect, at least in the current climate models, to explain individual cold winters.

Doug has also conducted leading research on the possibility of climate models underestimating predictable signals, the so-called "signal-to-noise paradox". Doug was involved right from the beginning in uncovering this paradox, which remains unresolved. Doug's deep and clear thinking has helped to bring this to the attention of the climate science community, and it is now creating widespread interest.

Doug is the first British winner of the Hans Oeschger Medal award for 18 years.

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